BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

FILED
10/21/19
04:59 PM

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COMMENTS OF THE COALITION OF CALIFORNIA UTILITY EMPLOYEES ON THE ORDER INSTITUTING RULEMAKING REGARDING MICROGRIDS PURSUANT TO SENATE BILL 1339

October 21, 2019

Rachael E. Koss
Danika L. Desai
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
(650) 589-1660 Voice
(650) 589-5062 Fax
rkoss@adamsbroadwell.com
ddesai@adamsbroadwell.com

Attorneys for the Coalition of California Utility Employees

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Pursuant to Rule 6.2 of the Commission's Rules of Practice and Procedure, the Coalition of California Utility Employees (CUE) submits these comments on the Order Instituting Rulemaking Regarding Microgrids Pursuant to Senate Bill 1339. CUE is a coalition of unions that represent approximately 43,000 people who work for nearly all of the investor-owned and publicly-owned utilities in California, and for contractors working for those utilities.

I. INTRODUCTION

Pursuant to SB 1339,[1] the Commission opened this OIR to craft a policy framework for commercializing microgrids. The Commission must develop standards, protocols, guidelines, methods, rates and tariffs that reduce barriers to microgrid deployment while achieving important State policy goals. The OIR identifies policy goals related to microgrid development, including reducing greenhouse gas emissions, adapting to climate change, and protecting public health, safety, and lives during catastrophic events. Both SB 1339 and the OIR also prohibit cost shifting.

[1] Pub. Util. Code §§ 8370-8372.

CUE commends the Commission for acknowledging the need to deploy microgrids in a manner that achieves these policy goals. Doing so requires careful Commission planning and attention. Importantly, the Commission must ensure that:

1) microgrid energy storage systems decrease GHG emissions;
2) properly trained and qualified workers install and maintain microgrids to protect public and worker safety;
3) microgrids truly do not shift costs between ratepayers as prohibited by the law; and
4) microgrids that are public utilities are properly regulated.

Absent mechanisms to ensure these goals are met, the development of microgrids could frustrate, rather than promote, the State's progress towards decarbonization, safety, and resiliency.

II. THE COMMISSION MUST ENSURE THAT MICROGRIDS REDUCE GREENHOUSE GAS EMISSIONS

Microgrids, which include battery energy storage systems, are often touted as a means to achieve State goals to reduce GHG emissions.[2][3] But the Commission knows, based on its experience with the Self-Generation Incentive Program (SGIP), that battery storage does not reduce GHG emissions absent regulation or incentives.

When evaluating the impact of SGIP energy storage on GHG emissions, the Commission found that "SGIP storage has led to a net ***increase*** in greenhouse gases (GHGs), in part because TOU peak periods have not aligned with high grid emission times, and in part because retail rates incentivized customers to prioritize noncoincident demand charge management over time

[2] *Microgrid Assessment and Recommendation(s) to Guide Future Investments*, CEC (Jul. 2015), available at https://ww2.energy.ca.gov/2015publications/CEC-500-2015-071/CEC-500-2015-071.pdf, stating "Expansion of microgrids in California supports California's legislative and regulatory goals as microgrids can reduce greenhouse gas emissions, support reliability and resiliency, and facilitate higher levels of distributed generation."
[3] *California Energy Commission – Tracking Progress*, CEC (Aug. 2018), available at https://ww2.energy.ca.gov/renewables/tracking_progress/documents/energy_storage.pdf.

of use (TOU) rate arbitrage."[4] Battery charging does not always occur when renewables are powering the grid and battery discharging does not always occur when fossil-fuel derived energy is powering the grid. In a worst-case scenario, a battery could charge with fossil-fuel derived energy and replace renewable energy when discharged. Also, because of roundtrip efficiency losses, even when a battery charged with a fossil fuel displaces that *same* fossil fuel source, emissions increase.

To tackle this problem, the Commission published the Self-Generation Incentive Program Greenhouse Gas Staff Proposal, which proposed mechanisms to ensure that storage systems actually decrease emissions, including withholding 50% of SGIP funding until operators could show documented GHG reductions.[5] Implicitly, the Staff Proposal acknowledged that absent incentives to do so, battery energy storage will not decrease GHG emissions.

Because microgrids include energy storage systems[6] and are often connected to the wholesale power grid,[7] microgrids can increase GHG emissions. Without SGIP-like incentives to operate in a way that reduces GHG emissions, microgrid operators will likely charge batteries whenever energy is cheapest and discharge batteries whenever energy is most expensive (or when most effective to reduce demand charges). This would increase GHG emissions, contrary to State policy goals. The Commission must learn from its SGIP experience and ensure the proper regulation or incentives to reduce GHG emissions exist *prior* to microgrid development.

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[4] *Revised Self-Generation Incentive Program Greenhouse Gas Staff Proposal*, Energy Division, CPUC, Distributed Generation Rulemaking 12-11-005 at 5, available at https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Demand_Side_Management/Customer_Gen_and_Storage/Revised%20SGIP%20GHG%20Staff%20Proposal_Clean_12-27-18.pdf (emphasis added).

[5] *Id*. at 6.

[6] Pub. Util. Code § 8370(d).

[7] *See California Customer Choice: An Evaluation of Regulatory Framework Options for an Evolving Electricity Market*, CPUC (August 2018), stating "most of these micro grids remain connected to the utility distribution network."

III. THE COMMISSION MUST ENSURE THAT MICROGRIDS ARE DEPLOYED SAFELY WHICH REQUIRES A WELL-TRAINED WORKFORCE

A. Battery Energy Storage, a Key Component of Microgrids, Poses Safety Risks

The Commission should be fully aware of the safety issues associated with distributed energy resources, and specifically battery storage. Lithium-ion batteries are currently the predominant technology type for energy storage systems. Lithium-ion batteries are very sensitive to mechanical damage and electrical surges. This type of damage can result in internal battery short circuits that lead to internal battery heating, battery explosions and fires. The loss of a single battery can rapidly cascade to surrounding batteries, resulting in a large fire.[8] The larger the battery system, the greater the risk.[9] "Larger cells exhibit slower heat transfer to their exteriors, and they usually have higher capacities. Thus, they have the potential to convert more electrical energy to internal heat."[10] As a result, California Fire Code section 1206.2.9 states that lithium battery systems above 600 kWh in size are considered High Hazard equipment and must comply with Group H (High Hazard) occupancy requirements. Microgrid systems are likely to have battery systems of this size or higher.

Lithium-ion battery fires have already occurred at energy storage systems in the United States. For example, in April 2019, a fire broke out at a 2 MW energy storage system in Surprise, Arizona where flames were 75 feet high. The fire hospitalized four firefighters from chemical inhalation burns. The Surprise fire was not the first fire to occur at an energy storage system in

[8] See, for example, Paul Hesler and Kenneth A. Travers, *Lithium-ion Battery Energy Storage Systems—The Risks and How to Manage Them*, July 17, 2019; available at http://www.hazardexonthenet.net/article/171930/Lithium-ion-Battery-Energy-Storage-Systems-The-risks-and-how-to-manage-them.aspx.
[9] Mikolajczak, et al, Exponent Failure Analysis Associates, Inc., *Lithium-Ion Batteries Hazard & Use Assessment – Final Report*, Fire Protection Research Foundation (July 2011) pp. 61–62, https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Hazardous-materials/rflithiumionbatterieshazard.ashx?la=en.
[10] *Id.*

Arizona. In November 2012, a 1.5-MW energy storage system at the APS Elden Substation near Flagstaff, Arizona, caught fire.[11] The root cause analysis for this fire also identified a near miss in May 2012 when a battery cell was severely discharged and the cell was continuously charged contrary to its intended design.[12] Following the Surprise fire, the Arizona Public Service shut down two other battery storage systems as a precaution.[13]

At 1.5 and 2 MW output capacity, the Arizona energy storage systems that caught fire are a similar size to microgrid storage systems. Clearly, even these "small" storage systems pose risks. The OIR states that one benefit of microgrids is to provide power in the case of catastrophic events such as wildfires.[14] But to ensure that microgrid storage is not also a *cause* of fires, the Commission should be fully aware of the safety risks involved and develop a plan to minimize those risks. That plan should include a well-trained and qualified workforce to deploy microgrids.

B. The Commission Should Require Microgrid Installation and Maintenance Work be Done by a Well-Trained and Qualified Workforce to Ensure Safety

A well-trained and qualified workforce can prevent and mitigate the risks described above. The Commission has recognized the value of trained professionals for other electrical infrastructure programs. For example, the Commission has repeatedly decided that electric vehicle infrastructure programs provide safer electrical service when "all of the construction and installation of the EV charging infrastructure" is performed by electricians "with EV

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[11] H. J. Mai, *APS Storage Facility Explosion Raises Questions about Battery Safety*, Utility Dive, April 30, 2019; available at https://www.utilitydive.com/news/aps-storage-facility-explosion-raises-questions-about-battery-safety/553540/.
[12] Sandra D. Kennedy, Commissioner, Re: In the Matter of the Commission's Inquiry of Arizona Public Service Battery Incident at the McMicken Energy Storage Facility Pursuant to Arizona Administrative Code R14-2-101, Docket No. E-01345A-19-076, August 2, 2019, p. 2; available at https://docket.images.azcc.gov/E000002248.pdf.
[13] Mai, *supra* note 10.
[14] OIR at 2.

infrastructure training certification."[15] The Commission's standard for the construction and installation for energy storage and microgrid equipment should be no different.

Specifically, the Commission should require that:

(1) all construction of microgrids shall be performed by IBEW signatory contractors who hold a valid C-10 contractor's license; and

(2) all specialized electric work on batteries and conversion systems be performed by contractors and certified electricians who have Energy Storage and Microgrid Training and Certification (ESAMTAC).

ESAMTAC is a training program that "prepares electrical contractors and workers for the safe and effective assembly, testing, commissioning, maintenance, repair, retrofitting, and decommissioning of energy storage and microgrid systems."[16] Requiring ESAMTAC, which is based in part on standards and codes developed or approved by National Fire Protection Association (NFPA), would help minimize the risks associated with fires described above. NFPA is currently developing a code (NFPA 855) for battery energy systems because gaps exist in current regulation, and these standards will likely continue to evolve with the technology. Workers who install and maintain these systems must have knowledge of the most up-to-date safety information. Requiring these standards helps ensure that microgrid installations will be high-quality, safe and efficient.

[15] E.g., D.16-01-045 approving SDG&E's Power Your Drive program, D. 16-12-065 approving PG&E's Charge Smart and Save program, and D.16-01-023 approving SCE's Charge Ready program. The training certification program is called Electric Vehicle Infrastructure Training Program (EVITP).
[16] ESAMTAC, https://www.esamtac.com (last visited Oct. 7, 2019).

IV. THE COMMISSION MUST ENSURE THAT MICRGORID DEVELOPMENT DOES NOT SHIFT COSTS BETWEEN CUSTOMERS

SB 1339 requires no cost shifting. The Commission must therefore ensure that microgrid development is not another NEM catastrophe. NEM was originally intended as a subsidy to jump start rooftop solar. Participating customers received large economic incentives to install rooftop solar because rooftop solar was not otherwise economically justified. NEM customers sell power into the grid at the full retail rate (even though the value of renewable generation is far less), and they also avoid paying their share of the cost of distribution and transmission service. The retail value assigned to renewable generation is entirely misaligned with the actual value of incremental renewable generation from a NEM generator. This creates a revenue shortfall that, in turn, leads to extra costs imposed on non-participating customers since utilities must recover the costs of grid service. As a result, the NEM subsidy shifts costs from wealthier, participating customers to non-participating customers, including low-income customers. Recognizing that the NEM subsidy was no longer justified nor fair to non-participating customers, in 2013, the Legislature enacted AB 327 requiring the Commission to revise the NEM subsidy to equalize the benefits and costs to all customers.

If microgrids proliferate around the State, cost shifting could intensify. Indeed, in its report, *Microgrids: A Regulatory Perspective*, the Commission explicitly recognizes the dangers of rate shifting in the microgrid context. The Commission states that when a:

> microgrid consumes less electricity from the distribution utility, a question of equity rises since utility costs are recovered through rates. In other words, if the microgrid is purchasing less electricity from the distribution utility, either in total or as an offset due to some tariff, similar to net-metering, these lost utility costs must be recovered by other customers.[17]

[17] Christopher Villareal, David Erickson, and Marzia Zafar, *Microgrids: A Regulatory Perspective*, CPUC (April 14, 2014) at p. 19

Cost shifting is especially unfair because IOUs act as providers of last resort.[18] If a microgrid fails, the IOUs are the default provider, which means that the IOU must have the resources to maintain transmission lines and deliver electricity to microgrid-served regions. The Commission must therefore ensure that microgrids pay their fair share of transmission and distribution costs.

V. MICROGRIDS THAT ARE PUBLIC UTILITIES MUST BE REGULATED

Public utilities are "subject to the jurisdiction, control, and regulation of the commission."[19] Public utilities include electrical corporations[20] which are defined as

> every corporation or person owning, controlling, operating, or managing any electric plant[21] for compensation within this state, except where electricity is generated on or distributed by the producer through private property solely for its own use or the use of its tenants and not for sale or transmission to others.[22]

The law is clear. If a microgrid delivers electricity to any member of the public besides the electricity producer or its tenants, that microgrid is an electrical corporation subject to Commission regulation. Indeed, in *Microgrids: A Regulatory Perspective*, the Commission acknowledged that some microgrids would be subject to Commission regulation.[23] Regulating public utility microgrids will ensure that the public policy goals of the State are met.

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[18] *California Customer Choice: An Evaluation of Regulatory Framework Options for an Evolving Electricity Market*, CPUC (August 2018) at 22.
[19] Pub. Util. Code § 216(c).
[20] *Id*. §§ 216(a) and (b).
[21] "Electric plant" is defined as "all real estate, fixtures and personal property owned, controlled, operated, or managed in connection with or to facilitate the production, generation, transmission, delivery, or furnishing of electricity for light, heat, or power, and all conduits, ducts, or other devices, materials, apparatus, or property for containing, holding, or carrying conductors used or to be used for the transmission of electricity for light, heat, or power." Pub. Util. Code § 217.
[22] Pub. Util. Code § 218(a).
[23] Christopher Villareal, David Erickson, and Marzia Zafar, *Microgrids: A Regulatory Perspective*, CPUC (April 14, 2014) at p. 12, stating "This set of definitions and the regulatory authority of the CPUC defined by these Public Utility Code sections hint at some of the challenges that the existing regulatory structure poses to microgrid development."

VI. CONCLUSION

SB 1339 and the OIR require that the Commission develop microgrids in a manner that achieves State policy goals. CUE urges the Commission to ensure that: (1) microgrid energy storage systems decrease GHG emissions; (2) adequately trained and qualified workers install and maintain microgrids to protect public and worker safety; (3) microgrids truly do not shift costs between ratepayers as required by the law; and (4) microgrids that are public utilities are properly regulated.

Dated: October 21, 2019

Respectfully submitted,

/s/

Rachael E. Koss
Danika L. Desai
Adams Broadwell Joseph & Cardozo
601 Gateway Blvd., Suite 1000
South San Francisco, CA 94080
(650) 589-1660 Voice
(650) 589-5062 Fax
rkoss@adamsbroadwell.com
ddesai@adamsbroadwell.com

Attorneys for the Coalition of California Utility Employees